phere of research and find expression among the workers from all countries. The views of contemporary workers on this subject were explained and it was stated that while the adherents of the theory of magmatic emanations may go too far in some directions, this theory has come to stay, and that it and no other satisfactorily explains a great number of ore deposits.

The prevailing theoretical tendencies of the present might be summed up as follows: We unanimously agree in seeking the ultimate source of the metals in the igneous rocks. We say that the rarer metals in concentrated forms, dissolved in water, emanate from the magmas during and after their eruption into higher levels of the lithosphere, and that minerals containing these metals are deposited along the pathways of the waters. We assert that atmospheric waters may search the congealed rocks, abstract from them a part of the small residues of the valuable metals, and deposit them along the channels. We say further that metamorphism, when acting upon these igneous rocks, is a potent factor in favor of further concentration, aided by the moisture contained in the rocks.

We say finally that as erosion degrades the volcanic mountains and their ore deposits, and the fragments are carried down to form sedimentary beds, the heavy native metals, such as gold and platinum, are concentrated into placers, and the baser metals are distributed as salts of various kinds throughout the beds. Atmospheric waters take up these particles into solution, and, aided by the influence of reducing substances as organic matter, concentrate them as deposits in congenial places.

At the close of Mr. Lindgren's address the fifteenth annual meeting of the society was held for the purpose of electing officers, and the following officers were elected for the ensuing year.

President—Mr. Waldemar Lindgren.

Vice-presidents—Mr. M. R. Campbell and Mr. A. H. Brooks.

Secretaries—Messrs. Ralph Arnold and Philip S. Smith.

Treasurer—Mr. Joseph A. Taff.

Members at Large of the Council—C. A. Fisher, F. L. Hess, C. E. Siebenthal, G. B. Richardson, George H. Ashley.

Fred E. Wright,
Secretary

DISCUSSION AND CORRESPONDENCE

THE TEACHING OF MECHANICS

To the Editor of Science: It seems to me high time for something to be done for the teaching of the first principles and definitions of mechanics in our schools. In the "Report of the Committee of the Central Association on Algebra in the Secondary Schools" which has just reached me. I find the following:

> 6. Momentum = velocity × weight. It is a measure of the force with which one body strikes another.

The "clear and concise statements" of physical laws which the committee recommends should have the additional merit of a reasonable degree of accuracy.

Ernest W. Brown

New Haven, Conn.

ADJUSTABLE BURDEN BASKETS

To the Editor of Science: Dr. William L. Abbott has sent to the U. S. National Museum five Dyak burden baskets of an entirely new type. They might be called "adjustable burden baskets," since by means of lacings their holding capacity may be expanded or contracted, like a shoe front.

Three of the specimens have each a framework of two U-shaped bows crossing on the bottom; the others have each a four-sided footing, incurved on the sides and pinched in at the corners to fit the lower ends of the four uprights that strengthen the body. All of the specimens are left open, the wrapping on the upper margin being continued down the front opening and united at the "up-set," or place where the bottom turns into the body. Hence the two margins are joined together in the examples with U-shaped bows even to the center of the bottom. The border consists of a small rattan stem, whose close neat wrapping with a thin split of the same material is, at intervals of an inch or two, united with the warps on the sides and to the twined weaving of the upper margins, by mousings.

There are other features of the specimens that will be described and illustrated in a larger paper on Malaysian basket work in preparation. I wish now to call attention to a new variety of textile and to inquire concerning the existence of other examples.

O. T. MASON

U. S. NATIONAL MUSEUM,
January 30, 1908

NOTE ON THE "LAFAYETTE BEDS" OF LOUISIANA

SOME very interesting facts are being brought to light in southern Louisiana by the large number of oil-wells put down since the date of the famous Lucas gusher in 1901.

In undisturbed beds near the coast we find the Quaternary molluscan fauna extending down to about 2,000 feet. The drill samples show sands, clays and gravels, the latter of typical Lafayette type to at least 1,500 feet. Oyster reefs are encountered more or less frequently, showing a sinking of several hundred feet in comparatively late times. In the Texas Galveston well, and in the regions where underlying beds have been brought up near the surface, as in the Jennings oil field, the first pre-Quaternary fauna is *Miocene* in appearance, not Pliocene. It has been customary to regard the Lafayette as approximately Pliocene. But our well records seem to indicate that the seaward continuation of the gravels in the central portion of Louisiana as well as in those states to the east and west are rather Quaternary than Pliocene, and that the whole embayment region, perhaps, was above sea-level in Pliocene times and was being eroded instead of being below sea level and receiving hundreds of feet of coarse littoral sediment. It would seem then, that Hilgard's views as to the contemporaneousness and interrelationship of the coarse "Orange sands" in the south and the ice sheets in the north may prove correct in spite of the fact that certain "Lafayette" gravels are said to lie beneath glacial till farther north.

G. D. HARRIS

SPECIAL ARTICLES

THE PENETRATING RADIATION

IN the present article three distinct methods will be given to show that the penetrating radiation which produces part of the ionization in closed vessels is not due to γ rays from radium in the ground itself. It seems quite probable that the penetrating radiation must be due to radioactive products in the air and it is quite probable that the origin of these products is in the ground as Elster and Geitel's theory indicates.

The first method is based upon the radium content of the various rocks as analyzed by Strutt and Eve. The highest value for the radium content of sedimentary rocks was found to be $2.92(10)^{-12}$ grams of radium per gram of rock. The mean value found by Strutt for sedimentary rocks was $1.1(10)^{-12}$ grams and by Eve $.8(10)^{-12}$ grams. The value of the radium content varies greatly with the locality, but for surface soils which are subjected to all the various kinds of weather changes the radium content is probably smaller than that found above. For instance, Strutt found a radium content for chalk at the bottom of a cliff to be $.39(10)^{-12}$ grams and at the top of the same cliff $.12(10)^{-12}$ grams.

$.9(10)^{-12}$ grams per gram of rock will probably be in general a maximum value for surface rocks. This quantity will be called Q.

Eve (*Phil. Mag.*, Sept., 1906) has determined K, the number of ions produced per c.c. by the γ rays in air from one gram of radium bromide supposed concentrated at a point and at a distance of 1 cm. The number of ions produced per c.c. at a point near the surface by a semi-spherical shell of ground of radius r and thickness dr is

$$\frac{2\pi r dr \delta K Q}{r \times .6} \varepsilon^{-\lambda r},$$

where δ is the density (about 2.7) and λ is the coefficient of absorption for the ground (say .09). The factor .6 comes in since K is given for radium bromide and Q for pure radium; K is $3.1(10)^9$. The total number of ions produced per c.c. per second by the ground would be

$$\int_0^\infty \frac{2\pi r \delta K Q dr}{.6r} \varepsilon^{-\lambda r}.$$

This value comes out about .8 ion per c.c. per second as a probable maximum amount.